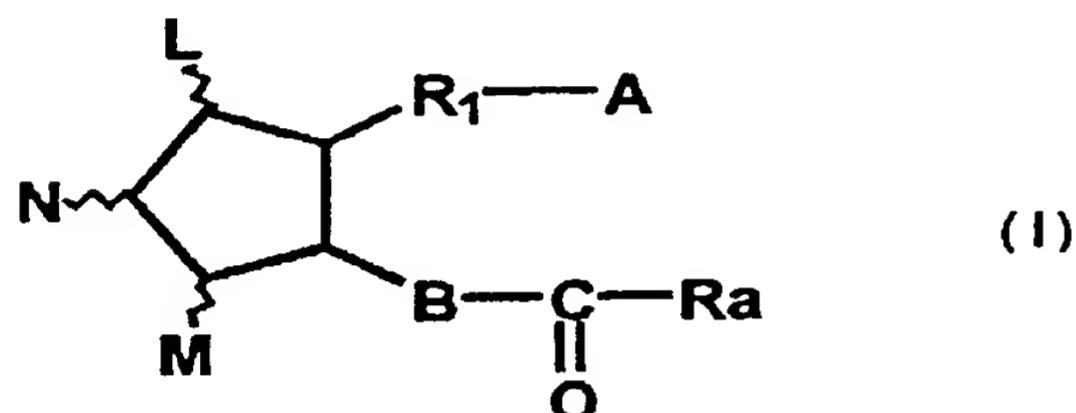


What is claimed is:

- 1 An apoptosis inhibitor composition comprising a 15-keto-prostaglandin compound as an active ingredient.
2. The composition of claim 1, wherein the 15-keto-
5 prostaglandin compound is the one represented by the general formula (I):



wherein L, M and N are hydrogen, hydroxy, halogen, lower alkyl, hydroxy(lower)alkyl or oxo, wherein at least one of L and M is a group other than hydrogen, and the five-membered ring may have at least one double bond;

A is $-\text{CH}_2\text{OH}$, $-\text{COCH}_2\text{OH}$, $-\text{COOH}$ or a functional derivative thereof;

B is $-\text{CH}_2-\text{CH}_2-$, $-\text{CH}=\text{CH}-$ or $-\text{C}\equiv\text{C}-$;

15 R₁ is a divalent saturated or unsaturated lower-medium aliphatic hydrocarbon residue, which is unsubstituted or substituted with halogen, oxo, aryl or heterocyclic; and

20 Ra is a saturated or unsaturated lower-medium aliphatic hydrocarbon residue, which is unsubstituted or substituted with halogen, oxo, hydroxy, lower alkoxy, lower alkanoyloxy, cyclo(lower)alkyl, cyclo(lower)alkyloxy, aryl,

aryloxy, heterocyclic or heterocyclic-oxy; cyclo(lower)alkyl; cyclo(lower)alkyloxy; aryl; aryloxy; heterocyclic; or heterocyclic-oxy.

3. The composition of claim 1, wherein the 15-keto-
5 prostaglandin compound is a 13,14-dihydro-15-keto-
prostaglandin compound.
4. The composition of claim 1, wherein the 15-keto-
prostaglandin compound is a 15-keto-16-mono or dihalogen-
prostaglandin compound.
- 10 5. The composition of claim 1, wherein the 15-keto-
prostaglandin compound is a 13,14-dihydro-15-keto-16-
mono or di-halogen-prostaglandin compound.
6. The composition of claim 1, wherein the 15-keto-
prostaglandin compound is a 15-keto-16-mono or di-fluoro-
15 prostaglandin compound.
7. The composition of claim 1, wherein the 15-keto-
prostaglandin compound is a 13,14-dihydro-15-keto-16-
mono or di-fluoro-prostaglandin compound.
8. The composition of claim 1, wherein the 15-keto-
20 prostaglandin compound is a 15-keto-20-lower alkyl-
prostaglandin compound.
9. The composition of claim 1, wherein the 15-keto-
prostaglandin compound is a 15-keto-20-ethyl-prostaglandin
compound.
- 25 10. The composition of claim 1, wherein the 15-keto-

prostaglandin compound is a 2-decarboxy-2-(2-carboxy lower alkyl)-15-keto-prostaglandin compound.

11. The composition of claim 1, wherein the 15-keto-
prostaglandin compound is a 2-decarboxy-2-(2-carboxy
ethyl)-15-keto-prostaglandin compound.

12. The composition of claim 1, wherein the 15-keto-
prostaglandin compound is a 2-decarboxy-2-(2-carboxy
ethyl)-13,14-dihydro-15-keto-16-mono or di-fluoro
prostaglandin compound.

10 13. The composition of claim 1, wherein the 15-keto-
prostaglandin compound is a 2-decarboxy-2-(2-carboxy
ethyl)-13,14-dihydro-15-keto-16-mono or di-fluoro-20-ethyl-
prostaglandin compound.

14. The composition of claim 1, wherein the 15-keto-
15 prostaglandin compound is a 2-decarboxy-2-(2-carboxy
ethyl)-13,14-dihydro-15-keto-16,16-difluoro-20-ethyl-
prostaglandin compound.

15. The composition of claim 1, wherein the 15-keto-
prostaglandin compound is a 15-keto-prostaglandin E
20 compound.

16. The composition of claim 1, wherein the 15-keto-
prostaglandin compound is 2-decarboxy-2-(2-carboxyethyl)-
13,14-dihydro-15-keto-16,16-difluoro-20-ethyl-prostaglandin
E₁.

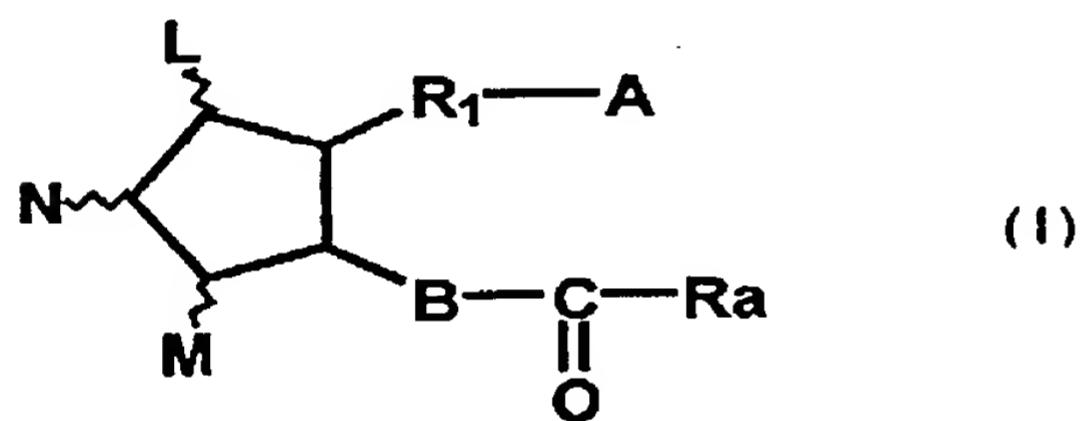
25 17. The composition of claim 1, wherein apoptosis is

an eye disorder caused by light.

18. The composition of claim 1, wherein the inhibitor composition is in the form suitable for ophthalmic administration.

5 19. A method for inhibiting apoptosis which comprises administering an effective amount of a 15-keto-prostaglandin compound to a subject in need of apoptosis inhibiting treatment.

10 20. The method of claim 19, wherein the 15-keto-prostaglandin compound is the one represented by the general formula (I):



15 wherein L, M and N are hydrogen, hydroxy, halogen, lower alkyl, hydroxy(lower)alkyl or oxo, wherein at least one of L and M is a group other than hydrogen, and the five-membered ring may have at least one double bond;

A is $-\text{CH}_2\text{OH}$, $-\text{COCH}_2\text{OH}$, $-\text{COOH}$ or a functional derivative thereof;

B is $-\text{CH}_2-\text{CH}_2-$, $-\text{CH}=\text{CH}-$ or $-\text{C}\equiv\text{C}-$;

20 R₁ is a divalent saturated or unsaturated lower-medium aliphatic hydrocarbon residue, which is unsubstituted or

substituted with halogen, oxo, aryl or heterocyclic; and

R_a is a saturated or unsaturated lower-medium aliphatic hydrocarbon residue, which is unsubstituted or substituted with halogen, oxo, hydroxy, lower alkoxy, lower alkanoyloxy, cyclo(lower)alkyl, cyclo(lower)alkyloxy, aryl, aryloxy, heterocyclic or heterocyclic-oxy; cyclo(lower)alkyl; cyclo(lower)alkyloxy; aryl; aryloxy; heterocyclic; or heterocyclic-oxy.

21. The method of claim 19, wherein the 15-keto-

10 prostaglandin compound is a 13,14-dihydro-15-keto- prostaglandin compound.

22. The method of claim 19, wherein the 15-keto- prostaglandin compound is a 15-keto-16-mono or dihalogen- prostaglandin compound.

15 23. The method of claim 19, wherein the 15-keto- prostaglandin compound is a 13,14-dihydro-15-keto-16- mono or di-halogen-prostaglandin compound.

24. The method of claim 19, wherein the 15-keto- prostaglandin compound is a 15-keto-16-mono or di-fluoro- prostaglandin compound.

20 25. The method of claim 19, wherein the 15-keto- prostaglandin compound is a 13,14-dihydro-15-keto-16- mono or di-fluoro-prostaglandin compound.

26. The method of claim 19, wherein the 15-keto- prostaglandin compound is a 15-keto-20-lower alkyl-

prostaglandin compound.

27. The method of claim 19, wherein the 15-keto-prostaglandin compound is a 15-keto-20-ethyl alkyl-prostaglandin compound.

5 28. The method of claim 19, wherein the 15-keto-prostaglandin compound is a 2-decarboxy-2-(2-carboxy lower alkyl)-15-keto-prostaglandin compound.

29. The method of claim 19, wherein the 15-keto-prostaglandin compound is a 2-decarboxy-2-(2-carboxy 10 ethyl)-15-keto-prostaglandin compound.

30. The method of claim 19, wherein the 15-keto-prostaglandin compound is a 2-decarboxy-2-(2-carboxy ethyl)-13,14-dihydro-15-keto-16-mono or di-fluoro prostaglandin compound.

15 31. The method of claim 19, wherein the 15-keto-prostaglandin compound is a 2-decarboxy-2-(2-carboxy ethyl)-13,14-dihydro-15-keto-16-mono or di-fluoro-20-ethyl-prostaglandin compound.

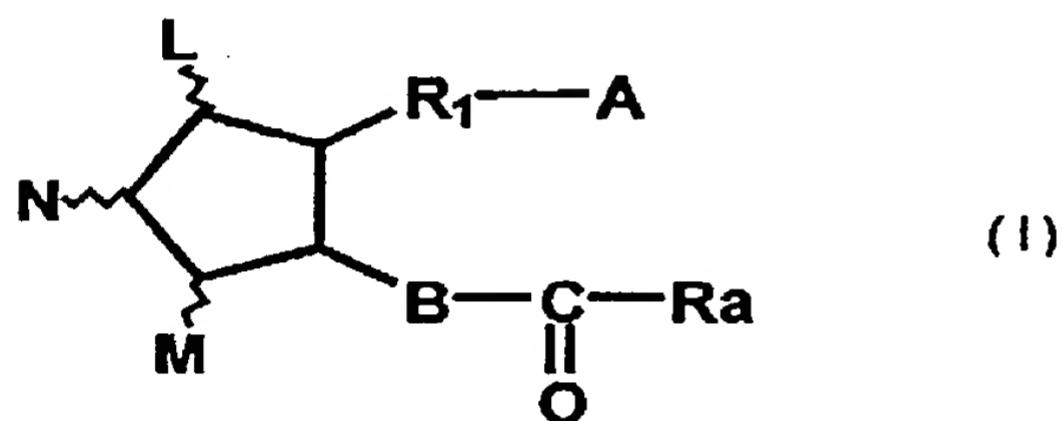
32. The method of claim 19, wherein the 15-keto-prostaglandin compound is a 2-decarboxy-2-(2-carboxy ethyl)-13,14-dihydro-15-keto-16,16-difluoro-20-ethyl-prostaglandin compound.

20 33. The method of claim 19, wherein the 15-keto-prostaglandin compound is a 15-keto-prostaglandin E compound.

34. The method of claim 19, wherein the 15-keto-prostaglandin compound is 2-decarboxy-2-(2-carboxy ethyl)-13,14-dihydro-15-keto-16,16-difluoro-20-ethyl-prostaglandin E₁.

5 35. Use of a 15-keto-prostaglandin compound for producing a pharmaceutical composition for inhibiting apoptosis.

10 36. The use of claim 35, wherein the 15-keto-prostaglandin compound is the one represented by the general formula (I):



15 wherein L, M and N are hydrogen, hydroxy, halogen, lower alkyl, hydroxy(lower)alkyl or oxo, wherein at least one of L and M is a group other than hydrogen, and the five-membered ring may have at least one double bond;

A is -CH₂OH, -COCH₂OH, -COOH or a functional derivative thereof;

B is -CH₂-CH₂-, -CH=CH- or -C≡C-;

20 R₁ is a divalent saturated or unsaturated lower-medium aliphatic hydrocarbon residue, which is unsubstituted or substituted with halogen, oxo, aryl or heterocyclic; and

R_a is a saturated or unsaturated lower-medium aliphatic hydrocarbon residue, which is unsubstituted or substituted with halogen, oxo, hydroxy, lower alkoxy, lower alkanoyloxy, cyclo(lower)alkyl, cyclo(lower)alkyloxy, aryl, 5 aryloxy, heterocyclic or heterocyclic-oxy; cyclo(lower)alkyl; cyclo(lower)alkyloxy; aryl; aryloxy; heterocyclic; or heterocyclic-oxy.

37. The use of claim 35, wherein the 15-keto-prostaglandin compound is a 13,14-dihydro-15-keto-prostaglandin compound.

38. The use of claim 35, wherein the 15-keto-prostaglandin compound is a 15-keto-16-mono or dihalogen-prostaglandin compound.

39. The use of claim 35, wherein the 15-keto-prostaglandin compound is a 13,14-dihydro-15-keto-16-mono or di-halogen-prostaglandin compound.

40. The use of claim 35, wherein the 15-keto-prostaglandin compound is a 15-keto-16-mono or di-fluoro-prostaglandin compound.

20 41. The use of claim 35, wherein the 15-keto-prostaglandin compound is a 13,14-dihydro-15-keto-16-mono or di-fluoro-prostaglandin compound.

42. The use of claim 35, wherein the 15-keto-prostaglandin compound is a 15-keto-20-lower alkyl-prostaglandin compound.

43. The use of claim 35, wherein the 15-keto-prostaglandin compound is a 15-keto-20-ethyl-prostaglandin compound.

44. The use of claim 35, wherein the 15-keto-
5 prostaglandin compound is a 2-decarboxy-2-(2-carboxy lower alkyl)-15-keto-prostaglandin compound.

45. The use of claim 35, wherein the 15-keto-
prostaglandin compound is a 2-decarboxy-2-(2-carboxy ethyl)-15-keto-prostaglandin compound.

10 46. The use of claim 35, wherein the 15-keto-
prostaglandin compound is a 2-decarboxy-2-(2-carboxy ethyl)-13,14-dihydro-15-keto-16-mono or di-fluoro prostaglandin compound.

47. The use of claim 35, wherein the 15-keto-
15 prostaglandin compound is a 2-decarboxy-2-(2-carboxy ethyl)-13,14-dihydro-15-keto-16-mono or di-fluoro-20-ethyl-
prostaglandin compound.

48. The use of claim 35, wherein the 15-keto-
prostaglandin compound is a 2-decarboxy-2-(2-carboxy ethyl)-13,14-dihydro-15-keto-16,16-difluoro-20-ethyl-
20 prostaglandin compound.

49. The use of claim 35, wherein the 15-keto-
prostaglandin compound is a 15-keto-prostaglandin E compound.

25 50. The use of claim 35, wherein the 15-keto-

prostaglandin compound is 2-decarboxy-2-(2-carboxyethyl)-13,14-dihydro-15-keto-16,16-difluoro-20-ethyl-prostaglandin E₁.